CLAIMS

1. A compression member (2) for a flexible pneumatic structural element, consisting of an elongated air-tight hollow body (4) that can be subjected to pressure, wherein at least one pair of tight tension elements is helicoidally looped around the hollow body (4) in respectively opposite directions on each compression member (2), and wherein two node elements (11) are respectively provided per compression member (2), characterized in that

   - the compression member (2) is elastically bendable, has a plate-like shape and is rigidly connected to the shell (1), in that

   - the compression member (2) is flat and can be rolled up in the deflated state of the pneumatic structural element, and in that

   - the compression member (2) is bent and essentially assumes the shape of a cylinder segment in the inflated, pressurized state of the pneumatic structural element such that the pressurized shell (1) stabilizes the compression member (2) in this shape.

2. The compression member (2) according to claim 4 [sic], characterized in that the connection with the shell (1) is realized such that the stress σ_u of the shell (1) is transmitted onto the compression member (2).

3. The compression member (2) according to claim 2, characterized in that it is bonded to the shell (1) or connected to the shell (1) by means of welding over its entire surface.

4. The compression member (2) according to claim 3, characterized in that it increasingly unrolls and assumes its stretched, functional shape as the pressure being built up in the shell (1) increases.

5. The compression member (2) according to claim 4, characterized in that it is designed such that is buckling load is increased.

6. The compression member (2) according to claim 5, characterized in that it is composed of two plates (6) that form a hollow body (4) when it is subjected to a pressure $p_1 > p_2$, namely such that the compression member (2) assumes a tubular shape.

7. The compression member (2) according to claim 5, characterized in that it is provided with an elastic joint (5) that centrally extends over its entire length and to which a web (7) is hinged, wherein this web (7) is connected to the shell (1) in the region of the surface line lying opposite of the joint (5) by means of a plurality of filaments (8).

8. The compression member (2) according to claim 5, characterized in that at least one tubular shell (9) is arranged on the plate (6) of the compression member (2), wherein an elastically bendable plate (6) is also arranged on the inner side of this tubular shell and bends up when the shell (9) is pressurized.

9. The compression member (2) according to claim 1 or one of Claims 5-8, characterized in that multiple compression members are arranged on the shell (1).

10. The compression member (2) according to claim 1 or one of Claims 5-9, characterized in that the at least one

compression member (2) is arranged within the shell (1).

11. The compression member (2) according to one of claims 1, 5, 6, 8 or 9, characterized in that the at least one compression member (2) is arranged on the outside of the shell (1).

12. The compression member (2) according to one of claims 1, 5, 6 or 9, characterized in that the at least one compression member (2) is arranged between different layers of the shell (1).

13. The compression member (2) according to one of the preceding claims, characterized in that its node elements (11) can be attached to connecting elements (15).

14. A node element (11) for at least one flexible compression member (2), characterized in that it is provided with at least one eye (13), through which a bolt (17) of a non-rotatable mounting arrangement can be respectively inserted.

15. A connecting element (15) for flexible pneumatic structural elements, characterized in that

- means for mounting at least two node elements (11) are provided, and in that

- the mounting means are designed such that the flexible pneumatic structural elements are arranged at a predetermined angle relative to one another in their functional shape.

16. The connecting element (15) according to claim 15, characterized in that pairs of coaxial eyes (16) are

provided, between which one respective node element (11) with an eye (13) can be non-rotationally mounted by inserting a bolt (17).

17. The connecting element (15) according to claim 15, characterized in that at least two upper and two lower pairs of coaxial eyes are provided, and in that the position of the upper pairs relative to the lower pairs defines the angle between the flexible pneumatic structural elements in their functional shape.

18. A pneumatic element structure, characterized in that it is composed of flexible pneumatic structural elements with flexible compression members (2) and connecting elements (15), and in that the pneumatic structural elements are automatically erected and assume a predetermined shape when they are subjected to pressure.

Revised Claims
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CLAIMS

1. A flexible pneumatic structural element, consisting of an elongated air-tight hollow body (4) that can be subjected to pressure, wherein at least one pair of tight tension elements is helicoidally looped around the hollow body (4) in respectively opposite directions on each compression member (2), and wherein two node elements (11) are respectively provided per compression member (2), characterized in that

   - the compression member (2) is elastically bendable, has a plate-like shape and is rigidly connected to the shell (1), in that

   - the compression member (2) is flat and can be rolled up in the deflated state of the pneumatic structural element, and in that

   - the compression member (2) is bent and essentially assumes the shape of a cylinder segment in the inflated, pressurized state of the pneumatic structural element such that the pressurized shell (1) stabilizes the compression member (2) in this shape.

2. The flexible pneumatic structural element according to claim 1, characterized in that the connection between the compression member (2) and the shell (1) is realized such that the stress σ_u of the shell (1) is transmitted onto the compression member (2).

3. The flexible pneumatic structural element according to claim 2, characterized in that the compression member (2) is bonded to the shell (1) or connected to the shell (1) by means of welding over its entire surface.

4. The flexible pneumatic structural element according to claim 3, characterized in that the compression member (2) increasingly unrolls and assumes its stretched, functional shape as the pressure being built up in the shell (1) increases.

5. The flexible pneumatic structural element according to claim 4, characterized in that the compression member (2) is designed such that is buckling load is increased.

6. The flexible pneumatic structural element according to claim 5, characterized in that the compression member (2) is composed of two plates (6) that form a hollow body (4) when it is subjected to a pressure $p_1 > p_2$, namely such that the compression member (2) assumes a tubular shape.

7. The flexible pneumatic structural element according to claim 5, characterized in that the compression member (2) is provided with an elastic joint (5) that centrally extends over its entire length and to which a web (7) is hinged, wherein this web (7) is connected to the shell (1) in the region of the surface line lying opposite of the joint (5) by means of a plurality of filaments (8).

8. The flexible pneumatic structural element according to claim 5, characterized in that at least one tubular shell (9) is arranged on the plate (6) of the compression member (2), wherein an elastically bendable plate (6) is also arranged on the inner side

of this tubular shell and bends up when the shell (9) is pressurized.

9. The flexible pneumatic structural element according to claim 1 or one of Claims 5-8, characterized in that multiple compression members (2) are arranged on the shell (1).

10. The flexible pneumatic structural element according to claim 1 or one of Claims 5-9, characterized in that the at least one compression member (2) is arranged within the shell (1).

11. The flexible pneumatic structural element according to one of claims 1, 5, 6, 8 or 9, characterized in that the at least one compression member (2) is arranged on the outside of the shell (1).

12. The flexible pneumatic structural element according to one of claims 1, 5, 6 or 9, characterized in that the at least one compression member (2) is arranged between different layers of the shell (1).

13. The flexible pneumatic structural element according to one of the preceding claims, characterized in that its node elements (11) can be attached to connecting elements (15).

14. A flexible pneumatic structural element, characterized in that the node elements (11) are provided with at least one eye (13), through which a bolt (17) of a non-rotatable mounting arrangement can be respectively inserted.

15. A pneumatic element structure consisting of flexible pneumatic structural elements according to one of the preceding claims, characterized in that the flexible

pneumatic structural elements are connected by means of connecting elements (15), and in that the pneumatic element structure is automatically erected and assumes a predetermined shape when the flexible pneumatic structural elements are subjected to pressure.

16. The pneumatic element structure according to claim 15, characterized in that the connecting elements (15) for the flexible pneumatic structural elements contain

- means for mounting at least two node elements (11), and

- mounting means that are realized such that the flexible pneumatic structural elements are arranged at a predetermined angle relative to one another in their functional shape.

17. The pneumatic element structure according to claim 16, characterized in that the connecting elements are provided with pairs of coaxial eyes (16), between which one respective node element (11) with an eye (13) can be non-rotationally mounted by inserting a bolt (17).

18. The pneumatic element structure according to claim 16, characterized in that the connecting elements (15) are provided with at least two upper and two lower pairs of coaxial eyes, and in that the position of the upper pairs relative to the lower pairs defines the angle between the flexible pneumatic structural elements in their functional shape.